CAL Software Workshop

CalRecon

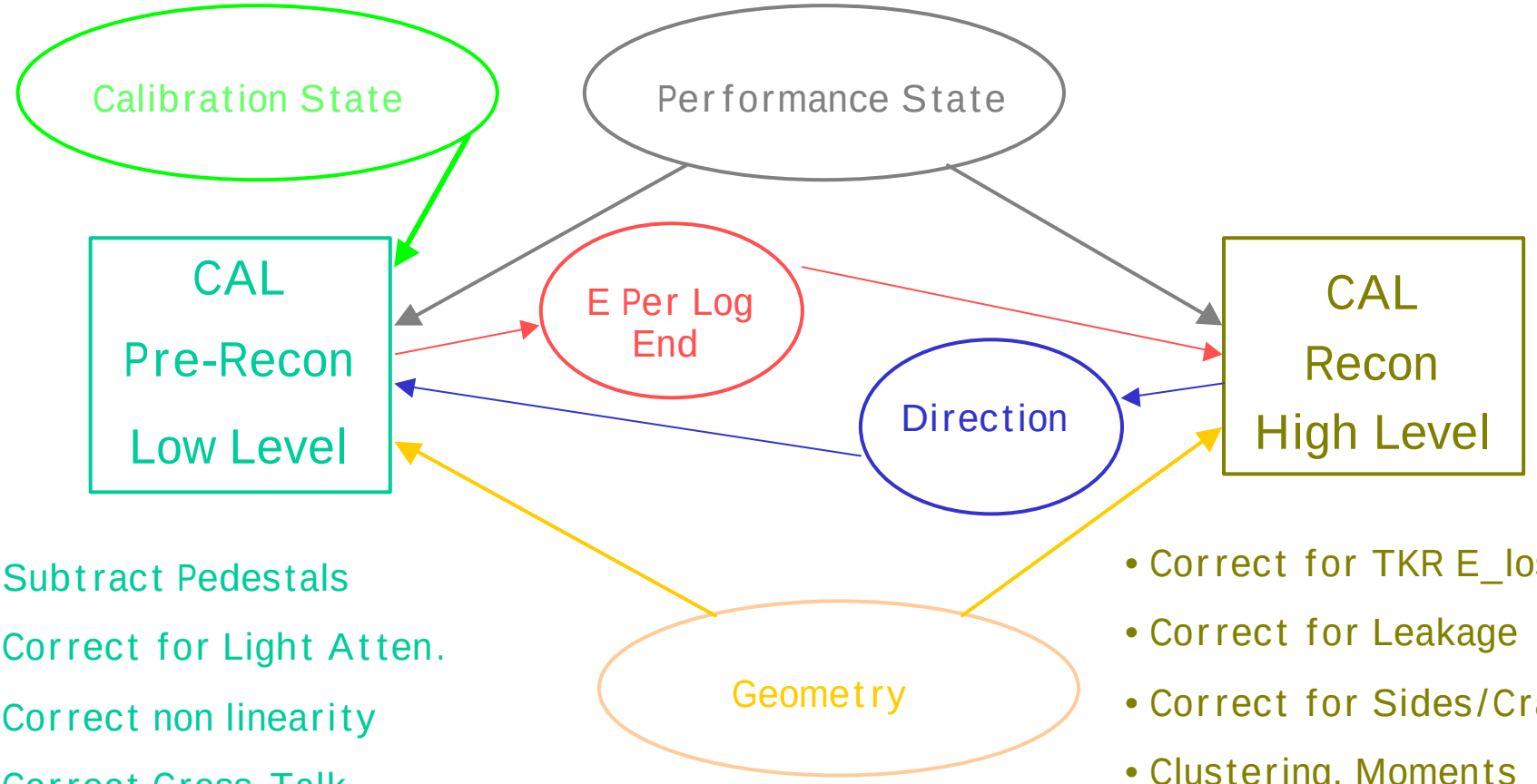
LATRecon?

November 2001

CALRecon : Goals

- Get the Best Energy Resolution
  - Best means SRD or better
- Maximise Effective Area
  - Efficiency of Cuts vs. Tails in Reconstructed Energy distributions
- Feedback with TKR to improve PSF & Energy Resolution
  - Clusters, Moments, ...
- Give Discriminate Variables for Background Rejection, feedback with ACD
  - LAT needs a factor 100 rejection from CAL (x ~ 1000 ACD) .
- VHE CalOnly events : Energy and Direction determination
- Identify heavy ions , keep pure dE/dx events for calibration (if High_z trigger events mixed with normal ones…), reject interacting particles

2 Steps : PreRecon & Recon

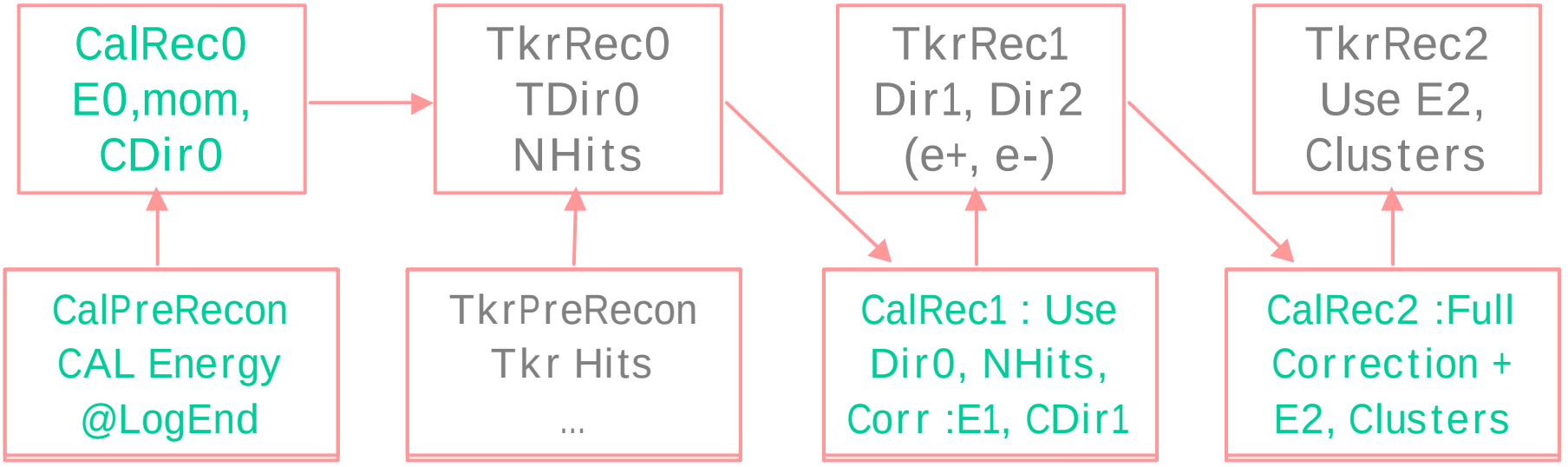


- Subtract Pedestals
- Correct for Light Atten.
- Correct non linearity
- Correct Cross-Talk
- Apply Gains

- Correct for TKR E_loss
- Correct for Leakage
- Correct for Sides/Cracks
- Clustering, Moments
- Yield Discriminant Vars

Iterative Recon : an “old example”

- Illustration : feedback btw CAL and TKR :



BUT this sequence should depend on energy, event, trigger type (Cal Hi, Tkr3ir, …)

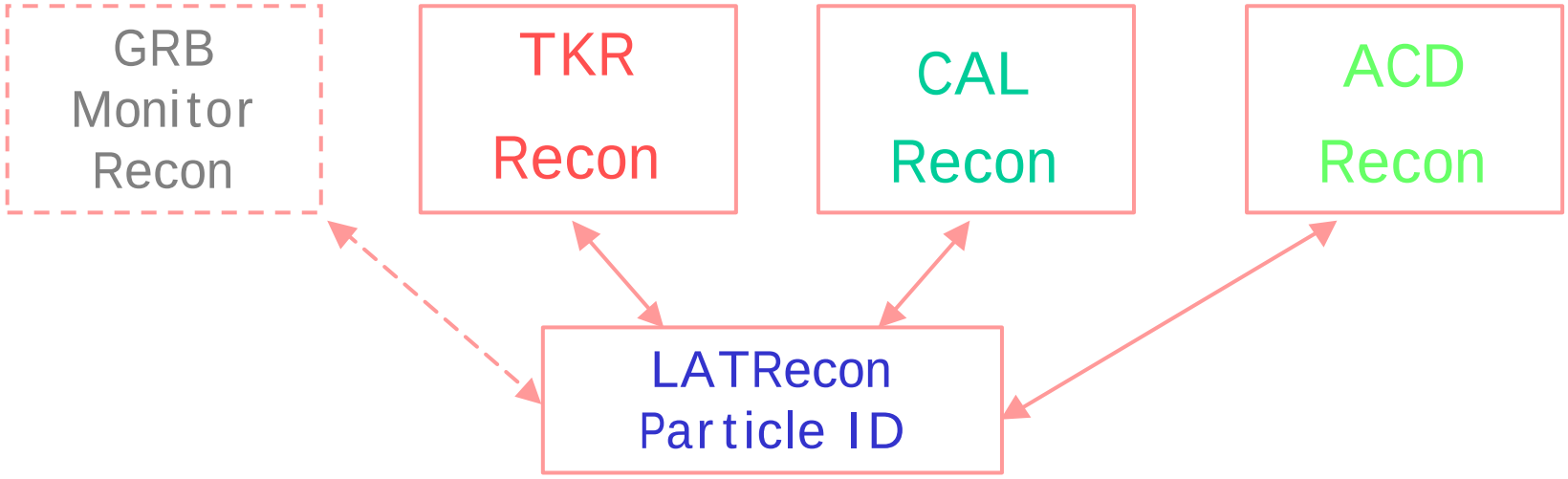
Iterative Recon : depends on type of event

- The iteration steps and order depend on type of event & trigger, and Esum
- Few examples:
  - if trigger = Cal High :
    - Reliable Cal_dir (direction), Cal_BCs (barycentres) available from Cal
    - No need for Tkr E_loss corrections
  - if trigger = Tkr 3 in a row: ⇒ call CalRecon determine Esum
    - if Esum ~< few 100 Mev (TBR) OR Cal_BC close to cracks/sides: TkrRecon has to give an initial guess of E ⇒ launch TkrRecon (Dir,E_loss?)
    - else : TkrRecon can use Esum to start Kalman, Ecal is refined in next step
  - if trigger = High_z trigger: initial particle = heavy ion:
    - TkrRecon can be called first ⇒ Ident_Flag : 1 good track?
    - In principle Cal can identify the ion (E pattern) : Z
    - AcdRecon can be called next to confirm/improve Ident_flag

CalRecon called first to reject interacting ions?

Iterative Recon : towards global LATRecon

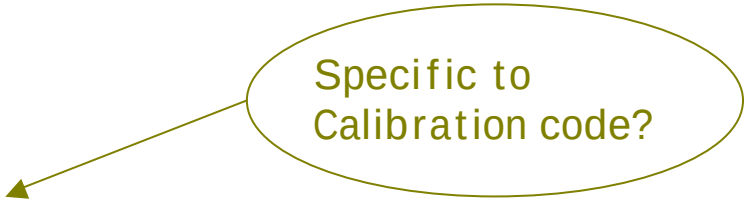
- Seems natural to have a Global Recon calling each sub-system Recon with appropriate parameters, depending on:
  - Trigger type, Acd hits number, Esum…



Means necessity of a Requirement document at the LAT level

Iterative Recon : depends on type of event

- CalRecon different instantiations :
  1. Esum
  2. Esum, Caldir0, moments0
  3. Ecorr, Caldir1, moments1
  4. Ecorr, clusters?
  5. Esum, IonIdFlag (from E pattern), Discriminant vars
  6. ...??
- TkrRecon???
- AcdRecon???



- Particle Identification package? Using observables from each subsytRecon
- Mainly discrimination between e- and γ, but also p, He